Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

Structure from motion images collected during marine debris surveys at coral reef sites entangled with derelict fishing nets at Pearl and Hermes Atoll in the Northwestern Hawaiian Islands from 2018/09/24 to 2018/10/03

1.2. Summary description of the data:

The photographs described in this dataset were collected using a Structure from Motion (SfM) approach during in-water marine debris swim surveys conducted by snorkelers in search of derelict fishing nets. Surveys were conducted by the NOAA Fisheries, Ecosystem Sciences Division (ESD) from September 24 to October 3, 2018 at Pearl and Hermes Atoll during an ESD-led marine debris mission to the Northwestern Hawaiian Islands (NWHI) aboard the NOAA Ship Oscar Elton Sette. The lagoon at Pearl and Hermes was surveyed equally across the spatial gradient, from locations where derelict fishing nets are common to locations where derelict fishing nets have never been observed.

During the 2018 mission, only a subset of marine debris surveys resulted in a SfM survey. Fishing nets were located during swim surveys and selected for SfM if the net was interacting with coral or hard substrate, the depth of the net was within ~1–4 m of the surface, and the area of the net fit within the 9 sq. meter SFM survey plot. During a SFM survey, a permanent 3 x 3 m plot was established around the center of the fishing net, and the net was photographed using a back and forth swim pattern (“before” photos) for later processing using a SfM approach. The net was then removed and the same area was photographed again in the same way (“after” photos). A nearby (>50 m distant) paired control site was also photographed using the same method (“control” photos).

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:

2018-09-24 to 2018-10-03

1.5. Actual or planned geographic coverage of the data:

W: -175.8211335, E: -175.7880926, N: 27.89404863, S: 27.82745706
Geographic extent of marine debris structure from motion surveys conducted at Pearl and Hermes Atoll.

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Image (digital)

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
Annette M DesRochers

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:

2.4. E-mail address:
annette.desrochers@noaa.gov

2.5. Phone number:
(808)725-5461

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:
Rhonda Suka

3.2. Title:
Data Steward

4. Resources
Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

Yes

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

Unknown

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Lineage Statement:

Marine debris removal has been conducted by the Pacific Islands Fisheries Science Center's Ecosystem Sciences Division at the atolls, reefs and islands of Northwestern Hawaiian Islands since 1996. Standardized data collection has been implemented since 1999. Swim surveys are typically used in the comparatively high-relief and patchy lagoonal reef habitats. Survey areas are chosen based on regional reef morphology and past accumulation records. At each Structure from Motion (SfM) data collection site, a permanent 3 x 3 m plot was established around the center of the net. SfM images were taken underwater before and after net removal. The same method was also used at the paired control sites.

Process Steps:

- The swim survey method was developed for surveys in lagoonal, reticulated reef areas. During swim surveys, two or more divers swim across reefs to search for debris while being directed by personnel in small boats to follow pre-planned routes and are coordinated for maximum visual area covered. Survey areas and routes are chosen based on regional reef morphology and past accumulation records. Based on this net prevalence information, five spatial zones were defined. A minimum of three nets in each of the five zones were surveyed using a Structure from Motion (SfM) approach if the net also fit within the additional selection criteria (≥ 75% hard substrate and within ~1-4 m depths). (Citation: Dameron, O. J., Parke, M., Albins, M. A., & Brainard, R. (2007). Marine debris accumulation in the Northwestern Hawaiian Islands: an examination of rates and processes. Marine Pollution Bulletin, 54(4), 423-433.)
- When a diver encounters debris larger than 0.012 cubic meters (size of small toolbox), descriptive data about the debris are recorded. At each site, a permanent 3 x 3 m plot was established around the center of the net by securing zip ties to the reef at each corner of the plot and taking a GPS location at the center. Depth measurements were recorded at each corner of the plot. Only nets that fit within the plot were selected for this study to allow rapid data collection of the Structure from Motion (SfM) imagery. SfM images were taken underwater before net removal to record the extent of the reef covered by net. Images were collected

by snorkeling in a cross-hatch pattern over the plot at 1 m above the substrate to achieve image overlap of at least 60% (~580 images per site). JPEG images were collected using a Nikon SL2 digital camera in an underwater housing. (Citation: Suka R, Asbury M, Couch C, Gray A, Winston M, Oliver T. 2019. Processing Photomosaic Imagery of Coral Reefs Using Structure-from-Motion Standard Operating Procedures. U.S. Dept. of Commerce, NOAA Technical Memorandum NOAA-TM-NMFS-PIFSC-93, 54 p. doi:10.25923/h2q8-jv47)
- Nets were disentangled from the reef by hand or carefully cut using knives to free the net from the benthos in order to minimize impacts to the underlying habitat. A second series of images were collected in the same manner as the before debris removal process.
- A paired control site was selected for each net within the same zone (≥ 50 m away from net-impact site for independence). The same photogrammetry method was also used at the paired control sites (3 x 3 m plot).

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):
Each image set was evaluated for image quality. Images deemed unsatisfactory were removed from the image set.

6. Data Documentation
The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?
No

6.1.1. If metadata are non-existent or non-compliant, please explain:
Missing/invalid information:
- 1.7. Data collection method(s)

6.2. Name of organization or facility providing metadata hosting:
NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:
https://www.fisheries.noaa.gov/inport/item/59423

6.4. Process for producing and maintaining metadata
(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

Yes

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:

National Centers for Environmental Information - Silver Spring, Maryland (NCEI-MD)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:

https://accession.nodc.noaa.gov/0210812
https://accession.nodc.noaa.gov/0210812
https://accession.nodc.noaa.gov/0210811
https://accession.nodc.noaa.gov/0210811
https://accession.nodc.noaa.gov/0210740
https://accession.nodc.noaa.gov/0210740

7.3. Data access methods or services offered:

Data can be accessed online via the NOAA National Centers for Environmental Information (NCEI) Ocean Archive.

7.4. Approximate delay between data collection and dissemination:

Unknown

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:

(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

NCEI-MD

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):

Pacific Islands Fisheries Science Center - Honolulu, HI

8.3. Approximate delay between data collection and submission to an archive facility:

Unknown

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

NOAA IRC and NOAA Fisheries ITS resources and assets.

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.